Exact/rounded missing lengths

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. Find the hypotenuse with legs 4 cm and 6 cm, exactly and to two decimal places. [3 marks]

$c = \sqrt{16 + 36} = \sqrt{52} \approx 7.2111\ldots$ cm.

Answer: $\sqrt{52}$ cm; 7.21 cm

2. Legs are 9 m and 12 m. Is 15 m an exact hypotenuse? Explain. [2 marks]

$c = \sqrt{81 + 144} = \sqrt{225} = 15$ m.

The root is an integer, so no rounding occurred.

Answer: Yes

3. Find the missing leg with hypotenuse 10 cm and other leg 6 cm. [2 marks]

$x = \sqrt{100 - 36} = \sqrt{64} = 8$ cm.

Answer: 8 cm

4. Find the missing leg with hypotenuse 15 m and other leg 10 m, exactly and to two decimal places. [3 marks]

$x = \sqrt{225 - 100} = \sqrt{125} \approx 11.1803\ldots$ m.

Answer: $\sqrt{125}$ m; 11.18 m

5. Legs are 4.3 m and 6.8 m. Find the hypotenuse to two decimal places. [3 marks]

$c^2 = 18.49 + 46.24 = 64.73.$

$c = \sqrt{64.73} \approx 8.0455\ldots$ m.

Answer: 8.05 m

6. A 2 m by 3 m rectangle has diagonal $\sqrt{13}$ m. Why is 3.61 m only approximate? [2 marks]

$d^2 = 2^2 + 3^2 = 13.$

3.61 is rounded; $\sqrt{13}$ retains the exact value.

Answer: $\sqrt{13}$ is irrational, so its decimal does not terminate.